

WHAT IS CLAIMED IS:

1. A method for synthesizing carbon nanotubes using magnetic fluid by thermal chemical vapor deposition, which comprises the steps of:

- (S1) producing a catalytic metal using the magnetic fluid;
- (S2) coating the produced catalytic metal on a substrate; and
- (S3) synthesizing the carbon nanotubes.

2. The method of claim 1, wherein the step (S1) additionally comprises adding a binder to the catalytic metal.

3. The method of claim 1, wherein the magnetic fluid is produced from iron chloride.

4. The method of claim 1, wherein the step (S1) comprises the steps of:

(S1-1) producing an aqueous iron chloride solution with ferrous chloride, ferric chloride and distilled water;

(S1-2) heating and stirring the aqueous iron chloride solution;

(S1-3) adding ammonium hydroxide to the aqueous iron chloride solution to produce magnetite (Fe_3O_4) particles;

(S1-4) adding a surfactant to the aqueous iron chloride solution;

(S1-5) adding water and acetone to the aqueous iron chloride solution to separate the magnetite particles from liquid; and

(S1-6) producing a solution of catalytic metal with the magnetite particles, distilled water and a binder.

5. The method of claim 4, wherein the steps (S1-1) and (S1-3) further comprise adjusting the amount of iron chloride and ammonium hydroxide to obtain the magnetite (Fe_3O_4) particles of a desired size.

6. The method of claim 5, wherein the magnetite (Fe_3O_4) particles have a diameter of 10-100 nm.

7. The method of claim 4, wherein the surfactant used in the step (S1-4) is a fatty acid.

8. The method of claim 7, wherein the fatty acid is $\text{CH}_3(\text{CH}_2)_8\text{CO}_2\text{H}$.
9. The method of claim 7, wherein a portion of the fatty acid is added several times with interval.
10. The method of claim 1, wherein in the step (S2), the catalytic metal is coated on the substrate by injection.
11. The method of claim 1, wherein in the step (S2), the catalytic metal is coated on the substrate by dipping the substrate in a catalytic metal solution.
12. The method of claim 10, wherein the coating further comprises spin-coating the catalytic metal with a spin coater.
13. The method of claim 11, wherein the coating additionally comprises spin-coating the catalytic metal with a spin coater.
14. The method of claim 12, wherein the spin-coating is performed at a rotational speed of about 100-5,000 rpm.
15. The method of claim 2, wherein the binder is a ceramic binder, of which quantity is about 0.1-10 g.
16. The method of claim 1, wherein the step (S3) comprises step (S3-1) of charging the substrate coated with the catalytic metal into a heating device, into which a source gas is then introduced to synthesize the carbon nanotubes on the substrate.
17. The method of claim 16, wherein the source gas comprises acetylene, ammonia and hydrogen.
18. The method of claim 16, wherein the carbon nanotubes are synthesized at an atmospheric temperature of about 800-900 °C, after the substrate coated with the catalytic metal is charged into

the heating device.

19. The method of claim 1, wherein the steps (S2) and (S3) further comprise coating the substrate in a batch process, and continuously charging the substrate into the heating device.

20. The method of claim 19, wherein prior to charging the substrate into the heating device, the atmospheric temperature in the device is a temperature for synthesizing the carbon nanotubes.